

A Work Project, presented as part of the requirements for the Award of a Masters
Degree in Finance from the NOVA School of Business and Economics

CONTRIBUTION TO A STRATEGIC PLAN FOR THE IMPLEMENTATION OF
CONTINUOUS IMPROVEMENT PROCESS IN AN MRO

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Abstract

This Work Project studies the Continuous Improvement and Processes (CIP) department at TAP Maintenance & Engineering. The project has the objective to provide insights to align the activities of the department with the strategy of the organization. For such, two focuses were taken: (i) an internal analysis which highlighted a need for transversal change to ensure the adoption of Continuous Improvement at TAP, and (ii) a process which outlined objectives and projects to be pursued to prioritize CIP's activities in accordance with the organization's goals. The outcome includes (a) important recommendations concerning strategic planning and competition evaluation and (b) a process' output that reflects a balance among factors influencing the priority of projects.

Keywords: Strategic Plan, Change, Prioritization, Value Creation.

Table of contents

I)	Introduction and purpose of project	1
II)	Literature review	3
III)	Strategic and organizational overview	5
	a. Strategy at TAP M&E	5
	b. Continuous Improvement and Processes competences	7
	c. Continuous Improvement and organizational view	8
IV)	Process and analysis	10
	a. Process outline	10
	b. Competition analysis	13
	c. Process illustration by Work Project analysis	14
V)	Conclusion	20
	References	22
	Appendix	23

I) Introduction and purpose of project

In a competitive world, organizations strive to differentiate to attain a privileged positioning to gain competitive advantage as a fundamental driver of profitability and success. In this process, one essential step is to set a strategy permitting to align activities for a sustainable growth of the company. In such a perspective, the objective of this project is to provide guidance for the development of a strategic plan for the Continuous Improvement and Processes (CIP) department at TAP Maintenance & Engineering (TAP M&E), the aircraft Maintenance Repair and Overhaul (MRO) provider for the TAP Group¹.

The MRO activity is defined as “the set of all actions needed to restore a piece of equipment, machine, or system to a state where it operates at its required level of performance”². MRO is a very competitive industry characterized by a constant uncertainty climate, high demand variability, unforeseeable work scope as well complex and unpredictable flow paths aligned with unpredictable supplier response and material requirements. However, besides its challenging characteristics, the aircraft MRO industry is large and growing, and presents large potential profits to be made through efficient delivery of services. In 2014, ICF International consultants predicted that the “MRO market would grow 3.9% each year over the next 10 years and will be worth \$89 billion”³.

Since 1974, TAP has made the strategic option of having its fleet maintained in-house and has constituted an MRO provider in its structure: TAP M&E. The

¹ Reference to exhibit 1 for TAP Group’s organizational chart

² **Srinivasan, Mandyam M.; Bowers, Melissa R.; Gilbert, Kenneth C.** 2014. *Lean Maintenance Repair and Overhaul*. Mac Graw-Hill Education

³ Article by **Sarah-Jayne Russell**, published on 2014-10-06 in *mro-network.com*

organization, whose activity is mainly related to aircraft, engines and components maintenance, repair and overhaul, is composed of eight areas: three of production and five of corporate support⁴. In such organizational structure, the CIP department incorporates the Organization and Development area of TAP M&E and has the mission of “ensuring the management and coordination of organizational processes transversal to TAP M&E areas, as well as the development of Continuous Improvement programs to optimize the value chain associated to it”⁵. The CIP department is a vector of cultural change with the objective to create value for the company.

The purpose of this Work Project is then to provide CIP with insights and tools to develop a strategic plan of its own, allowing for the department to set a course of action aligned with the objectives defined in TAP M&E’s strategy. As the contribution and importance of each department is measured by the value it adds, such a plan should also be the reflection of how and where CIP should apply its capabilities to achieve its mission of adding value to the organization.

To reach such a goal, we will firstly assess CIP’s competences and the adoption of Continuous Improvement by TAP M&E while proposing recommendations for the department to fulfill its purpose in the organization. Secondly, we will design a process to operationalize the prioritization of projects associated to CIP’s objectives – so that CIP is provided with a systematic approach to assess the highest value creation opportunities in a consistent and analytical way – to ensure the department’s strategic alignment with TAP M&E.

⁴ Reference to exhibit 2 for TAP M&E’s organizational chart

⁵ TAP M&E Continuous Improvement and Processes mission

II) Literature review

While strategies define how organizations should use their resources to meet their objectives, strategic planning is about “trade-off decisions to allocate those resources between today’s business needs and the building of the future of the company”⁶.

Strategic planning becomes a prominent tool in the mid-1960s as it starts to be seen as an effective process to implement strategies to enhance competitiveness and company value. The first complete book on strategy and planning is George Steiner’s reference title *Top Management Planning* (1969) which was the first to provide a comprehensive view on the subject. Even though such a tool presented positive results, it did not avoid criticism, namely from Henry Mintzberg in *The Rise and Fall of Strategic Planning* (1994) where he states that strategic planning is flawed as it achieved in planning and executing, but not in creating and formulating good organizational strategies. One year earlier, Peter Lorange⁷ offers an interesting view on the process saying that strategy formulation should be made with different scopes at different organizational levels. He highlights *corporate strategy* at the top level, *business planning and strategy* at an intermediate level, and finally, *planning and strategy of departments* to select objectives for each functional area and to develop a “set of feasible action programs to implement division strategy”.

Along with strategy formulation, management control constitutes one of the pillars of the essential planning and control functions. While strategy formulation is the process of deciding on new strategies, management control is the process of

⁶ Taylor, James W. 1985. *Strategic Planning for the Successful Business*. New York: Alexander Hamilton Institute.

⁷ Lorange, Peter. 1993. *Strategic Planning and Control*. Cambridge: Blackwell Publishers

implementing and executing those strategies through decision-making and comparison of execution results with strategic objectives. According to Anthony and Govindarajan⁸, management control involves a variety of activities namely a) planning what the organization should do b) coordinating the activities of several parts of the organization c) communicating and evaluating information d) deciding what corrective action should be taken e) influencing people to change their behavior. The most traditional and common techniques for such measures are the Balanced Scorecard and benchmarking.

Implementation and success of strategy, planning and control in an organization is associated with a transformation of culture and mindset. Such connection provided many theories about how to do change known as Change Management. While some, as McCalman and Paton⁹, choose to address the topic by describing the nature, definition, causes and imperatives of changes, John Kotter, professor at the Harvard Business School, appears as the expert on change issues. Kotter's most interesting work in the field is published in 1996 in *Leading Change*¹⁰ where, from an empirical observation of organizations and thousands of leaders when they were trying to transform or execute strategies, he identified the success factors and introduced a model for helping managers deal with transformational change. Kotter's model comprises eight overlapping steps: the first three about creating a climate for change thanks to the alignment of people with the new vision; the next four engaging, enabling and preparing the organization for such change; and the last one on implementing and sustaining change¹¹.

⁸ **Anthony, Robert N.; Govindarajan, Vijay.** 2007. *Management Control Systems*. New York: MacGraw-Hill/Irwin.

⁹ **McCalman, James; Paton, Robert A.** 1992. *Change Management: a guide to effective implementation*. London: Paul Chapman Publishing Ltd

¹⁰ **Kotter, John P.** 1996. *Leading Change*. Boston: Harvard Business Review Press

¹¹ Over the years, the original steps of the model have been refined and adjusted thanks to supporting data to lead to an actual and more effective model presented in Exhibit 3.

III) Strategic and organizational overview

This Work Project was based on an analysis of internal data gathered from TAP M&E as well as interviews with the General Director of Maintenance and Engineering (DGME), head of the organization, and with the heads of TAP M&E's areas. In addition, the project was done under the guidance of the head of CIP, Eng° Pedro Costa.

The following sections present a discussion on TAP M&E's strategy and Continuous Improvement adoption for the fulfillment of this Work Project's objectives.

a. Strategy at TAP M&E

Although TAP M&E is under a transition process leading to the development of a strategic plan, the organization does not currently have a formal plan, due to the lack in giving priority to such a goal and in gathering resources for it. Hence, to assess the strategy of TAP M&E, we referred the DGME, who outlined the four pillars on which the planning should be built: satisfaction of clients, financial and economical profits, alignment of people, and at a farther but not lesser extent innovation and technology.

As TAP M&E is a department of TAP, S.A., the organization's objective is not to be focused on its own individual goals but rather to contribute to the success of the TAP Group. Hence, as M&E's strategy is explained in light of its service to TAP, we find that the first core component and priority of its strategy is to provide MRO services for the TAP fleet and contribute with it to the profitability of the airline. In addition, TAP M&E has a second central strategic objective, namely to minimize costs and, if possible, to increase its profitability. As its activity for the TAP fleet requires a fixed investment on capital and labor that is not fully used for those operations, TAP M&E uses its remaining capacity to make profits for the organization by serving third clients.

In fact, in TAP's strategic plan, the only reference to TAP M&E is for the organization to increase its services for third parties. Even though both objectives are compatible and understandable, they can lead to a conflict of interests when deciding priorities.

The last TAP M&E official strategic plan was delivered for the period 2010-2013 and states that the organization's mission is to "render maintenance and total aircraft support services constituting itself as its clients' partner in the concretion of their objectives". The organization aims at being a reference in the international market of aeronautics maintenance and develops its strategic plan for the latter period around the four pillars of the Balanced Scorecard. For each of these pillars, several scopes are defined, objectives are formulated, and strategies are set along with precise projects presenting plans of action, areas of responsibility, key performance indicators (KPIs) and goals to be reached.

However, even though such strategic plan is formulated, when compared to the previous plan for 2006-2010, the latest strategy is observed to come short of what has been done in the past. In fact, in 2006-2010, the organization developed an actual characterization of the business and the MRO industry, an evaluation of critical factors of success and comparison with competition, a SWOT analysis on internal and external factors, among other analysis, which are missing for 2010-2013. It is then noted that TAP M&E lacks a more comprehensive analysis of its environment and internal capabilities to allow it to present a more accurate plan based on real observation. In addition, we must indicate a possible deficiency of focus on a clear vision and path for the organization as we observe that the strategic plan rests on a number of projects and not on clear directions.

b. Continuous Improvement and Processes competences

As any other companies and industries, MROs are focused on optimization by elimination of waste to improve performance and profitability. One path to reach such goal is Continuous Improvement (CI) which refers to a set of strategies to identify and implement improvement opportunities in processes with the objective of creating value. To reach such goal, at TAP M&E, since 2010, a CIP department exists with the responsibility of establishing the operational transformation program of the organization to potentiate the growth of the business. In that sense, CIP has to ensure improvements in the performance of production processes, leading to results with significant short term financial impact - while guaranteeing cultural change and the alignment of processes with the strategy of the company.

To guide its activity, CIP has a mission and a set of responsibilities to apply as part of strategic objectives for the department, which translate into: (i) eliminating inefficiencies in the productive processes, (ii) identifying best practices while promoting knowledge sharing between areas and providing them with an external perspective on their problems, and (iii) implementing a dynamic participation of the entire organization in the continuous improvement effort. In the MRO context, these directives are applied mostly into expansion of capacities and reduction of costs, which are arguably the primary objective of an MRO. In light of such mission and responsibilities, CIP has developed capabilities aligned with productivity and efficiency improvement goals such as waste elimination and reengineering of processes. There are three tools associated to those competences namely (i) *Lean*, to eliminate waste in the value flow, (ii) *Theory of Constraints* focused on constraints of processes, and (iii) Six Sigma to care for quality and the reduction of processes' variability.

c. Continuous Improvement and organizational view

For the rightful implementation of CI in an organization, the transformation has to be a strategic priority executed with a top-down approach. Until now, CI implementation at TAP M&E has been a bottom-up process. Although positive results were achieved, for a true transformation, CI needs to be set as a concern of the entire organization and to be enforced from the top management to enable its adoption. For such, CIP's place in TAP M&E's organizational structure could be altered to reflect its priority: instead of being inserted into a specific area, it should be placed into a transversal position, directly under the DGME's dependence which would be responsible for the enforcement of CI in all areas of the organization. With such positioning, the department would be in a privileged place to bring innovation to the whole organization and help in the definition of strategies. Such a top-down approach and organizational view for CI introduction is not innovative and its success can be seen at Lufthansa Technik (LT), the strongest MRO in Europe in efficiency and innovation. In fact at LT, besides having one director responsible for CI only, the company discusses CI's strategy twice a year at the board level and sets it as an internal objective in each area's strategy. In addition, another important component of CI implementation is its mindset. CI is a change that should be communicated as an investment and workers should be able to verify its benefits by successful improvements so that they adhere to it. For such, the realization of Kaizen events can be an advantage as they allow the involvement of people in finding inefficiencies and solutions for their own work while they witness small but right improvements in their work.

CIP's range of action at TAP M&E can be seen as having two natures: projects within one area, and projects transversal to several areas. Projects within one area arise

from specific, internally identified, improvement needs. The area must promote and be responsible for its own project by committing its resources and availability for change. In such a perspective, CIP does not take the lead role but is responsible for giving support and know-how to the areas by defining project development, accompaniment method, and tools to be used. The department has hence to develop expertise in CI methodologies so that it is able to transmit them accurately to the different areas to guarantee improvements in processes and performance in each area. However, CIP's activity is not limited to providing know-how. Instead, it also should develop its own projects, transversal to several areas, to allow an improved connection between production and support areas. CIP should be able to apply its capabilities to detect inefficiencies and opportunities to improve across areas. Within such scope, CIP is responsible for assuming the coordination and realization of projects to promote the correct articulation of the areas and to ensure that the right strategic options are made so that all projects benefit the whole organization. In addition to its current responsibilities, CIP should also develop capacities in Process Engineering to provide an efficient design of processes from inception, hence avoiding creation of waste - while being able to introduce innovation in the organization.

Regarding CIP's internal organization and staffing, it is important to stress that its vision is conditioned by TAP M&E's top management investment decision and will have to be adapted to it. While it is important to keep a strong set of people at the heart of CIP to preserve its know-how and experience, innovative practices could be introduced allowing for circulation of people from different areas to CIP to gain and spread knowledge on CI to the whole organization. However, staffing in areas is also an issue given that the limited human resources for each cannot be spared for wide periods.

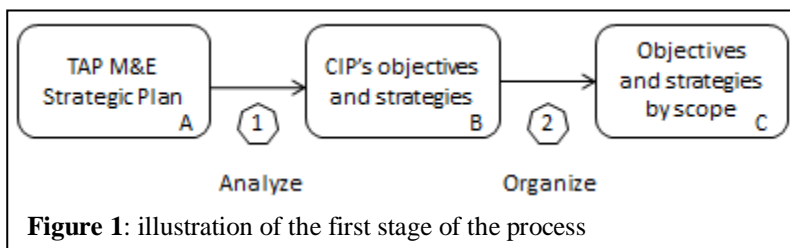
IV) Process and analysis

a. Process outline

To satisfy CIP's need for aligning its activity to TAP M&E's strategy, this Work Project provides a process designed to allow the department to outline objectives and prioritize projects that ensure the fulfillment of its mission towards the organization.

Until now, given CIP's debut, the department has made the option of focusing its resources on projects where results could be better appreciated. In that perspective, CIP has been prioritizing projects in production areas and projects arising from TAP airline's needs. However, to guarantee the department's alignment with the organization, a more thoughtful analysis is needed. The following process intends, in a first stage to define objectives and strategies for CIP aligned with TAP M&E's strategic plan; in a second stage to outline KPIs and evaluate the performance of such objectives and strategies; on a third stage to focus on defining specific projects according to the latter; and in a fourth and final stage to provide the criteria to prioritize them.

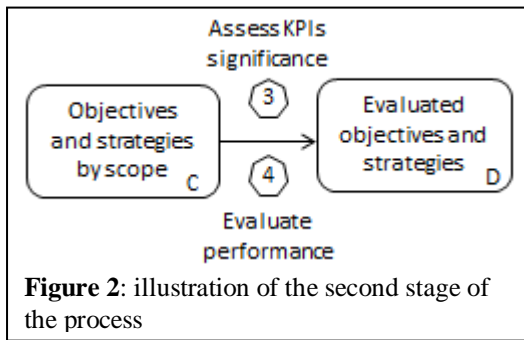
Stage 1: definition of objectives and strategies for CIP department.



Starting from TAP M&E's strategic plan (A), the 1st step is to analyze which

objectives and strategies allow a match between the organization's objectives and CIP's mission so that those that are compatible with CIP's responsibilities and capabilities (B) are isolated. In step 2, the identified objectives and strategies have to be organized in categories of CIP's competence (C), such as productivity and processes.

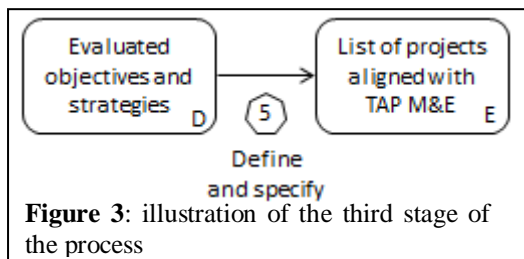
Stage 2: allocation of KPIs and assessment of performance.



From the identified objectives and strategies related to CIP’s activity (C), step 3 involves achieving an assessment of performance of objectives by (i) validating the significance of the existing KPIs of the organization, and (ii)

propose new KPIs if necessary. In a 4th step, the assessment is performed by a) an internal evaluation of the KPIs’ evolution and achievements of set goals b) a rigorous comparison of such internal performance with available data from competition in order to do a benchmarking of the organization in each scope to gauge margins of improvement (D).

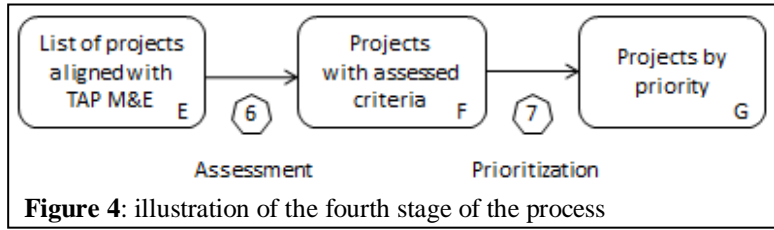
Stage 3: definition of projects according to identified objectives and strategies.



In step 5, the process focuses on outlining projects given CIP’s objectives and strategies (D). From TAP M&E’s strategic plan, it is possible to identify some projects that are

already defined to meet the previously defined goals. In addition, it is necessary to stipulate some other projects to meet those objectives and strategies that have no specific action yet. For the latter, it is required to specify for each project: the objective to be met, the strategy, the necessary KPIs, the area responsible for the project, the action that is necessary and the goal to be met. From these two sources of projects comes a list of specific projects (E), aligned with CIP’s objectives and strategies, and according to TAP M&E’s strategic plan.

Stage 4: prioritization of projects.



With defined projects (E), the final stage is to prioritize them according

to the goal of maximizing the value created to the organization. Such a goal, however, is not straightforward and involves additional research and analysis as the prioritization of projects can be based on four principal criteria: absolute value creation, strategic concern of the organization, current performance and identified improvement margin, as well as difficulty of implementation. In a 6th step, each of these criteria must be individually assessed for each project. Such an analysis will include the need of quantifying the value that each project can generate, specifying its difficulty namely in terms the resources used and time of completion, differentiating early wins projects from structuring ones, while taking into account TAP’s requirements and strategic necessities as they present a priority for value creation opportunities in the future. Given the individual assessment of each factor (F), step 7 is to prioritize projects according to the importance of each factor in value creation for the organization. As the criteria for prioritization also involve qualitative appreciations, this step cannot be performed purely on an analytical basis and has to involve a qualitative analysis. For such, the proposed approach is to attribute a value to each of the four factors of each project, given the factors’ assessment in step 6, to then be able to do a scoring, taking into account a weighting of each factor’s importance, that will allow a ranking of projects according to their contributions (G), as presented in the below table:

	Absolute value created	Strategic concern	Performance	Difficulty	SCORE	RANK
<i>Weights</i>	5	4	2	1		
Project 1	1-5	1-5	1-5	1-5	1-5	1-2
Project 2	1-5	1-5	1-5	1-5		

Table 1: matrix of scoring developed for projects prioritization

Regarding factors values, the higher the score, the higher the priority. Hence, for “Absolute value creation” and “Strategic concern” 1=low and 5= high are set so that the higher the assessment of each factor, the higher the priority; for “Performance” 1=high performance hence low margin of improvement and 5=low performance hence high margin of improvement are set so that the higher the margin of improvement, the higher priority the project receives; and for “Difficulty” 1=high difficulty and 5=low difficulty are set so that the lower the difficulty, the higher priority is given to the project. In addition, weights chosen were 5 for “Absolute value criteria” as it is the most important factor of decision, 4 for “Strategic concern” as the organization’s strategic objectives are of great importance for CIP to fulfill its mission, 2 for “Performance” as the greater the margin of improvement the more the project is important for the organization’s competitiveness, and 1 for “Difficulty” difficulty to provide for a balance between early wins and structuring projects while not allowing it to be a decisive factor.

b. Competition analysis

Before laying out the Work Project analysis there is a need to outline a gap in TAP M&E’s activity which is the lack of specific information about its MRO competitors related to third parties activities that is preventing the organization from assessing its relative performance and identify greater improvement opportunities. In fact, it is of great importance to gather data on competition to compare the organization to its direct competitors in order to develop accurate strategies allowing for maximum efficiency.

Such an analysis implies identifying all direct competitors in each sector of activity to characterize their strategic positioning and power, hence allowing for an assessment of TAP M&E’s relative position and influence. In addition, a clear knowledge of

competitors' abilities and moves is necessary, such as: evolution and growth, recent investments, organizational structure, strategic concerns, services offered, methodologies and tools used, among others. Furthermore, a benchmarking of the organization's performance relative to its competitors is required to assess the efficiency of activities of the organization by identifying deficiencies and opportunities of improvement. Such a process should be continuous and translated into a monitoring of competition in terms of prices, costs, productivity, profitability, TATs, services, margins and quality. In such a perspective, CIP's contribution could be valuable in providing support to develop methodologies to compare TAP M&E's performance with its competition to identify such improvement opportunities. Finally, it must be noted that attention to competition can provide opportunities for partnerships or insights which can lead to the introduction of innovation into the organization, a range of action that also falls within CIP's responsibilities.

c. Process illustration by Work Project analysis

In this section, the intent is to demonstrate how to perform a definition of priorities for CIP taking into account TAP M&E's strategy. Given, however, the restricted ability of providing a complete appraisal of the process, the approach will be limited to an illustration of the process rather to its complete assessment.

Stage 1: a full identification of objectives and strategies was performed to set CIP's focus on priorities of the organization by basing the analysis on TAP M&E's strategic plan for 2010-2013, the latest strategic plan in force. From such, a series of objectives and strategies were identified, aligned with the capabilities and competences of CIP defined in a previous section, presented in the following table 2. In addition to those

objectives and strategies arisen from TAP M&E’s strategic plan two other categories which fit CIP’s mission and capabilities were possible to identify by the assessment of the existing KPIs from the organization: Quality and Stocks, important explanatory variables of efficiency and productivity, which are presented in table 3. The existence of such KPIs reflects a concern from the organization in giving consideration to those factors and this initiative is meant to empower the implicit focus.

Scope	Objective	Strategy
Productivity	Maximize productivity	
	Improve the utilization of assets/means	Invest in assets that improve productivity
	Improve the productivity of human means	Implement effective control actions Reduce unitary costs of production
Processes & Systems	Increase capabilities of production	Invest in new products and repair technologies
	Improve systems/processes	
	Optimize processes of activity	Implement a Continuous Improvement Program
	Improve the productivity of human means	Optimize the invoicing and receipt process
	Improve systems of production support and information treatment	Invest in modern and user-friendly systems
	Improve the Human Resources information system	Create a reliable and efficient information management system Ensure a reliable and on-time information system
	Promote the correct attribution of responsibilities	Clarify competences between areas Ensure the efficiency of internal communication Clarify competences and responsibilities between units
Promote a Continuous Improvement culture	Create a system for recognition of good suggestions	
Quality	Improve quality	
	Improve quality of materials and services	Ensure that activities are done effectively and efficiently
Stocks	Optimize stocks	
	Increase stocks management efficiency	Create a global transversal system to find optimal stock levels

Table 2: Objectives and strategies identified as part of CIP’s action, by scope

Scope	Objective	Strategy
Quality	Improve quality	
	Improve quality of materials and services	Ensure that activities are done effectively and efficiently
Stocks	Optimize stocks	
	Increase stocks management efficiency	Create a global transversal system to find optimal stock levels

Table 3: Objectives and strategies for CIP emerging from TAP M&E’s activity

Stage 2: as the organization lacks data on competition, in this stage the focus is on a) the assessment of the significance of KPIs, b) the proposition of new KPIs, and c) an evaluation of performance solely based on an internal basis. In a first step, to appraise the significance of the existing KPIs, the analysis was based on several criteria to select a sufficient number of KPIs allowing a criterious and complete evaluation while trying not to be exhaustive: (i) only indicators that have a scope related to CIP’s activity were chosen, (ii) indicators that have a positive performance in the last three years have been

excluded as it is believed that in the next three years they will remain steady, and (iii) indicators that had a scope with small margin of improvement were disregarded. In addition, to facilitate the evaluation, the assessment is made by categories:

1. Productivity. This category can be divided into two scopes: increasing productivity, and investments. For the first category, existing KPIs allow having a good assessment of labor productivity and efficiency of the organization as a whole and of its production areas as there are productivity, costs of labor, capacity utilization ratios as well as indexes of utilization of capacity. In addition, we find useful to specify additional indicators related to: the assessment of the evolution of performance – such as the number of workers for unit of output; the assessment of evolution of costs of materials and labor – such as ratios on evolution of margins; and to Turn Around Times – such as standardization of TAT for the areas of production by aircraft, engine and component type, as well as work type. For the second scope – investments - a total lack of focus in capital was identified. Investments require an evaluation of the current productivity given the existing assets to check if the current capacity is giving results, and also to assess how the new investment will benefit the organization. In that sense, it is proposed that the organization focuses on a definition of capital productivity indicators.

2. Processes & Systems. As this category presents strategies that are related to non-productive activities, TAP M&E does not have specific indicators defined. The category refers to an optimization of invoicing and receipt process, which can be evaluated through medium duration of invoicing and receipts emissions, and to investment in systems, which can refer to an assessment of capital productivity of systems. In addition, other strategies are related to the update of systems, clarification of

competences and ensuring internal efficiencies which are related to process engineering and have not yet KPIs defined as that will have to be done in the design of each process.

3. Quality. In what concerns quality, TAP M&E has many indicators and for such, this category is where the KPI selection criteria laid above were more rigorously applied. The selected indicators that were believed to be more in line with CIP's objectives are divided into (i) technical incidents imputed to TAP M&E's services, (ii) inefficiencies in TAP M&E's services that required further expenses, and (iii) client satisfaction. In addition to those, it would be useful to characterize technical incidents and reliability by unit type (type of aircraft, engine, or component) and work type (type of inspection, of repair, of work scope), as well as calculating an indicator for the cost of lack of quality.

4. Stocks. All defined KPIs are considered relevant as they are only a total of five and their combination allows for a good assessment of the status of the process in place¹².

To evaluate the internal performance of each category, the analysis is based on 2013 quarterly values. On productivity, general objectives were not attained, unless in Components Maintenance (MC). Regarding processes, the only available KPI - Medium time of invoicing - was achieved at 100% in MC while in the others areas it remained at 0. For quality, the overall assessment is positive even though three indicators have not achieved the set goals. Finally, regarding stocks, the general assessment is of a good performance as only one indicator had a less positive rate of achievement.

Stage 3: rather than losing focus on specifying projects with little knowledge of processes, the option was made in turning the attention to the three production areas, as they are the ones providing a higher contribution of value and where the effectiveness of

¹² The exhaustive list of indicators for each category can be found in exhibit 4

the approach will be more in evidence. As such, the focus was set on identifying needs of areas' directors which allowed to specify four distinct projects for the illustration. Project 1 occurs in Engine Maintenance (MM) area and has the objective of improving productivity by gaining control on the repair process, with the ultimate objective to reduce TAT on engines. Projects 2 and 3 are related to the MC area, and have the respective objectives of a) maximizing use of resources and b) optimizing processes of activity. Finally, project 4 has particular nature as it is the preparation of the organization to serve the new A350 aircraft; it is not a defined action that is intended to be taken, it is rather a set of actions that involve the three areas of production as well as it will have to involve other support areas. For each project, the objectives that they would allow to meet, the strategy, the needed KPIs for assessment of performance, the action to be taken, and the goal to create value to the organization were defined¹³.

Stage 4: given TAP M&E's strategy and an evaluation of each criteria in accordance with the organization's capabilities, a scoring of each factor for each project was made in association with the head of CIP department - to ensure the reliability of such computation. Regarding "Absolute Value Created", we were not able to calculate a real measure of value created as such a computation required a higher knowledge of processes; however, we attributed values according to the potential of value creation. For Project 1, we attributed a potential of 4 as it involves improving a central process of MM, the area with higher profitability. In Project 2, we attributed a value of 3 given its ability of contributing for the higher productivity of MC. In addition, Project 3 received a score of 1 as it involves more a strategic concern rather than absolute value creation,

¹³ Projects are presented in detail in exhibit 5.

while Project 4 received a score of 2 for the same reasons - being however considered as having a relatively higher potential of creating value. Hence, regarding “Strategic Concern”, Project 4 has maximum priority of 5 as it is an obligation of TAP M&E to serve TAP fleet with the A350. Then, Project 4 received a value of 4 because profitability in MM is of great importance to the organization. As for Project 2 and 3, they were attributed values of 1 and 3 respectively as the first does not present a priority for TAP M&E, and the second presents a relative priority as it involves prioritizing work that will affect the activities of other production areas. In what concerns internal performance, we were only able to gather data from Project 1 and 2. For Project 1, performance is very low given that all KPIs chosen for evaluation failed to reach their goals, hence the attribution of score 3 signifying a relatively high margin of improvement. As for Project 2, performance is higher given the assessment of the indicators, hence margin of improvement is lower which justifies a score of 2. Finally, regarding difficulty of completion of projects, Project 4 has a very high difficulty as it involves several areas so it receives a score of 1. Project 1 receives a score of 2 given its difficulty in controlling the entire repair process. As for Projects 2 and 3, they are both attributed with scores of 3 given their medium difficulty. Following this assessment, we apply such factors’ values to the prioritization matrix and do the scoring with the defined weights for each criteria. Results are presented in table 4 and show priorities to Project 1 in first place, followed by Project 4, then Project 2 and finally Project 3.

	Absolute value created	Strategic concern	Performance	Difficulty	SCORE	RANK
<i>Weights</i>	5	4	2	1		
Project 1	4	4	3	2	3,7	1
Project 2	3	1	2	3	2,2	3
Project 3	1	3	n.a.	3	2,0	4
Project 4	2	5	n.a.	1	3,1	2

Table 4: scoring of projects given Work Project analysis

V) Conclusion

While absolute value creation is typically the number one priority, in an organization with TAP M&E's characteristics, strategic concern can take an unusual importance in the definition of priority activities to be undertaken.

In light of such observations, to increase TAP M&E's performance, the organization is recommended to set a priority in a definition of a strategic plan that can be the root of actions for each area; a plan setting a clear focus of the organization's mission and duties, showing an accurate evaluation of its internal abilities and of the external environment. Such a specification should be the origin for the development of a plan of actions by areas, to ensure that activities are built on priorities and strategic objectives. In addition, it is strongly advised to give special consideration of an attentive monitoring of competition for a complete evaluation of the organization's strengths and weaknesses as such an assessment would undoubtedly lead to a gain in competitiveness and a higher rate of introduction of innovation. Moreover, TAP M&E's top management has to do a serious reflection on the implementation of CI in the organization. Even though such an implementation has to be done step by step, a defined determination from the beginning empowers the introduction of such a culture.

The process illustration analysis started with the definition of strategies and objectives for CIP intended to allow the department to adopt a specific focus on TAP M&E's strategic plan given a thoughtful assessment of its mission and capabilities. Such a stage highlighted four different categories of concern: productivity, processes, quality, and stocks. Based on such categories, the process was designed to shed light on how CIP should approach the decision of launching projects given the complexity of

relationships between strategic concerns, value creation and other variables influencing priorities. The presented results reflect TAP M&E's strategic objectives. In fact, by laying out in first place Project 1, the most important project for profitability, and by positioning in second place Project 4, a very important strategic project for TAP airline, our work prioritizes both primary objectives of the organization. In addition, Projects 2 and 3, related to efficiency improvements, show a significant difference in scoring compared to the first two Projects 1 and 4: the range is from 2,2 (Project 2) to 3,1 (Project 4) representing 0,9 points of difference in a scale of 5. Such scoring interval shows a clear differentiation between projects with high value or high strategic importance compared to needed projects of efficiency and productivity improvements but which do not represent a priority for the fulfillment of TAP M&E's objectives. Hence, given the verification of alignment of results with the organization's strategy, it is suitable to state that our proposed approach was able to provide a correct prioritization of projects to allow CIP to create value while aligning its activities with TAP M&E. However, given this operationalization of the decision process, CIP has to continue developing its capabilities and fulfilling its responsibilities in a continuous assessment of priorities, finding the best equilibria between critical factors. Such a process must be dynamic, and must involve flexibility and control, as it implies a constant revision of the factors given the environment and strategies, and their adaptation according to their relative importance.

We conclude that such process for CIP and such measures for TAP M&E would contribute to the success of the department and the profitability of TAP, in a future that promises to be full of challenges and where the Group's strategy will likely have to be adapted to a new vision.

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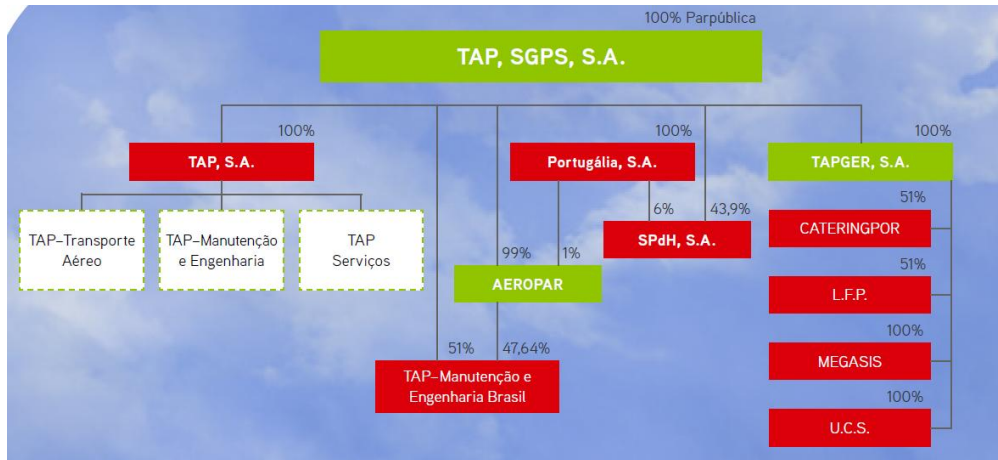
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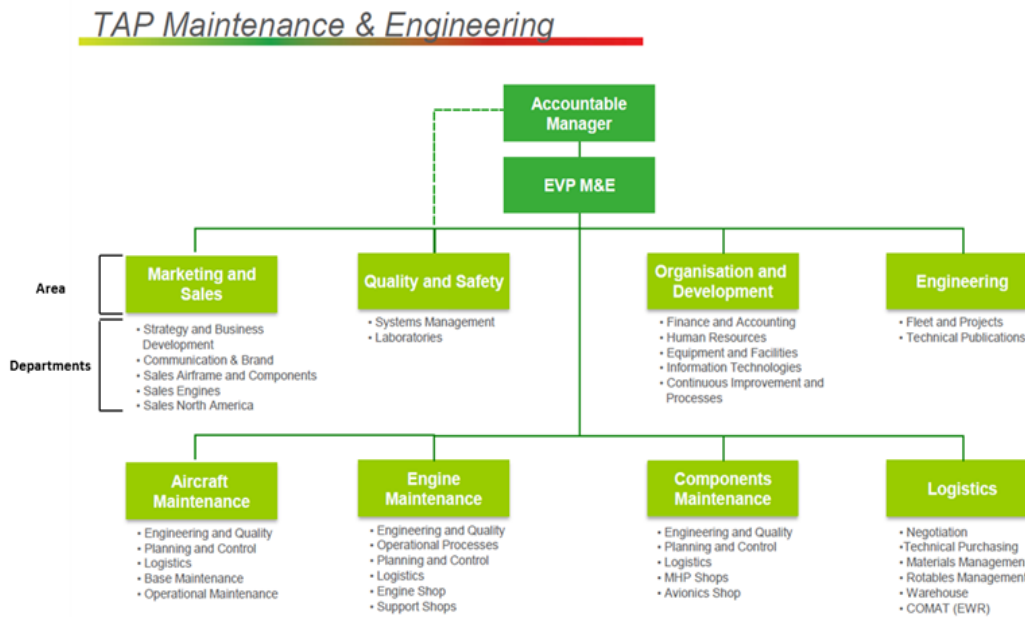
Appendix

Exhibit 1: TAP Group organizational chart



Source: TAP website; www.tapportugal.com

Exhibit 2: TAP M&E organizational chart



Source: TAP M&E

Exhibit 3: The “8-step Process for Leading Change”

1. Create a sense of urgency: craft and use a significant opportunity as a means for exciting people to sign up to change their organization.
2. Build a guiding coalition: assemble a group with the power and energy to lead and support a collaborative change effort.

3. Form a strategic vision and initiatives: shape a vision to help steer the change effort and develop strategic initiatives to achieve that vision.
4. Raise a large force of people who are ready, willing and urgent to drive change.
5. Enable action by removing barriers: remove obstacles to change, change systems or structures that pose threats to the achievement of the vision.
6. Generate short-term wins: consistently produce, track, evaluate and celebrate volumes of small and large accomplishments – and correlate them to results.
7. Sustain acceleration: use increasing credibility to change systems, structures and policies that don't align with the vision; hire, promote and develop employees who can implement the vision; reinvigorate the process with new projects, themes and volunteers.
8. Institute change: articulate the connections between the new behaviors and organizational success, and develop the means to ensure leadership development and succession.

Source: Kotter International; www.kotterinternational.com

Exhibit 4: exhaustive list of KPIs for assessment of performance of CIP objectives

Productivity	Scope	Processes & Systems
Aproveitamento de mão-de-obra	Labor Productivity	Tempo médio de facturação
Rácio MOI/MOD	Labor Productivity	PM facturação
VAB / Trabalhador	Labor Productivity	PM recebimento
Average nº of workers/Output (units)*	Labor Productivity	
Performance de MDO	Efficiency	
Cumprimento do TAT	Efficiency	
Nível de actividade	Efficiency	
Standardization of TATs*	Efficiency	
Evolution of margins relatives do labor and materials costs*	Costs	
Quality	Scope	Stocks
Incidência de Avarias após Revisões periódicas*	Technical incidents	Taxa de Rotação - Consumo
Fiabilidade de Despacho	Technical incidents	Taxa de Rutura - Consumo
Taxa de Incidentes Técnicos	Technical incidents	Taxa de Serviço - Consumo
Indicentes Técnicos de Manutenção	Technical incidents	Taxa de Obsolescência - Consumo
Acidentes	Technical incidents	Taxa de Serviço - Rotáveis
Média de Discrepâncias	Inefficiency	
Criticidade das Discrepâncias	Inefficiency	
Extensões à MEL	Inefficiency	
Índice de rejeição de Reatores (RREJ)	Inefficiency	
Cost of lack of quality*	Inefficiency	
Cumprimento do EGT (REGT)	Satisfaction	*KPIs not defined by TAP M&E
Taxa de Reclamações Aceites Aviões-Motores-Componentes	Satisfaction	
Índice de Satisfação do Cliente	Satisfaction	

Source: TAP M&E's management control KPIs and Work Project analysis

Exhibit 5: Details of identified projects from production areas

Project 1- Area: MM

Objective: Improve productivity

Strategy: Create a system for control and optimization of repair process

KPIs to evaluate performance: aproveitamento de mão-de-obra motores, VAB/trabalhador motores, nível actividade motores

Action: define critical path in system for all the stages of the process allowing for management control

Goal: reduce TAT

Details: to reduce TAT, and increase quality, there is a need to gain control of the entire repair process by developing a system which allows for the supervision of all activities from contracts to invoicing, in-house to outsourced repair, stocks and responsibilities.

Project 2 - Area: MC

Objective: Maximize use of resources

Strategy: optimize the allocation of human resources

KPIs to evaluate performance: aproveitamento de mão-de-obra, VAB/trabalhador in components

Action: compute the right number of technicians for each workshop and provide optimum workload of each.

Goal: maximize aproveitamento de mão-de-obra and VAB/trabalhador in components.

Details: with high uncertainty in work scope and continuously changing priorities, MC needs to find the optimal number of technicians with the right qualifications while allocating them according to the workload of each station. The project implies the measure of productivity of each worker and the computation of a matrix for workload distribution between them given components priority and nature.

Project 3 - Area: MC

Objective: Optimize processes of activity

Strategy: Improve definition of priorities

KPI to evaluate performance: n° of negatives, n° of zeroes

Action: define criteria for priorities in maintenance and design system for application

Goal: eliminate negatives, reduce zeroes

Details: to ensure delivery of priority components, control of work-in-progress and entrance of components is necessary to fulfill area mission.

Project 4 - Area: MA, MM, MC

Objective: Be the most attractive option for TAP client

Strategy: Guarantee the total support of the fleet

KPIs to evaluate performance: n° of A350 specialist's workers, relative n° of support tool for the A350, indices de fiabilidade frota TAP

Action: plan the execution of the reception of the A350, transversal to all areas, to ensure fulfillment of strategic objectives.

Goal: be prepared to serve the A350 upon its entrance to TAP fleet

Details: As the project is transversal to all areas of the organization, CIP must participate in activities to streamline the communication and ensure the adoption of the best transversal processes. Such an activity relates to Process Engineering competences.

Source: interviews with Director General of Maintenance and Engineering and production areas heads.